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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/656,677 | 09/04/2003 | Jiang Fan | 2775-PAT | 8803 |

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| EXAMINER |
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WALKER, KEITH D

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| ART UNIT | PAPER NUMBER |
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1745

DATE MAILED: 12/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|----------------------------|--|
| Office Action Summary | Application No. 10/656,677 | Applicant(s) FAN ET AL. | |
| | Examiner Keith Walker | Art Unit 1745 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 18-38 is/are pending in the application.
- 4a) Of the above claim(s) 19-25 and 27-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 18, 26 and 32-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/14/06 has been entered.

Claims 1-12 & 18-38 are pending in the application with claims 19-25 & 27-31 withdrawn. Claims 1-12, 18, 26 & 32-38 are pending examination and are rejected for the reasons below.

Claims Interpretation

It is held that an element with the "adapted for" language used in the claims is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense and therefore is not given patentable weight.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-12 & 32-38 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US Publication 2002/0028380 (Tanjo).

Tanjo teaches an electrode with active material particles of lithium manganese oxide substantially coated with a hydrophobic material of polyvinylidene fluoride (PVDF) and a conductive carbon material, acetylene black ([0033, 0077]). A lithium salt such as LiBF_4 is an ionically conductive material and is used in the electrolyte and also coats the active material in the polymer layer ([0040]). The electrode is made by mixing together the active material, the coating material (PVDF); the conductive material and a solvent to make an electrode material consisting of active particles, substantially coated. More of the hydrophobic material (PVDF) than the conductive material is used to coat the active material and so the coating substantially consists of the hydrophobic material ([0070, 0077]).

Since the electrode active material is made in the same manner as disclosed by the applicant, the properties of the material are inherently the same.

Claim Rejections - 35 USC § 103

2. Claims 1-12, 18, 26 & 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP Publication 2002-37364 (Nagura).

Nagura teaches a lithium secondary battery with a coating on the electrode's active material particles, lithium manganese oxide (Abstract, [0003]). The coating comprises a binding hydrophobic polymer such as polyvinylidene fluoride, an electrically conductive additive of carbon and an ion conductive additive such as LiBF_4 ([0014-0023]). The electrically conductive additive can also be aluminum, where the ratio of coating weight to particle weight is less than 20 percent ([0027]).

Nagura teaches the polymer is used to add flexibility to the electrode during the compression and expansion of the electrode during the charge and discharge of the battery ([0004, 0012-0014]). This flexibility allows for good contact between the particles and between the electrode and the cell containers during the charge and discharge process, thereby decreasing the internal resistance of the battery. The polymer coating offers to raise the high charge and discharge properties of a cell and strengthen the binding nature between each particle of the electrode ([0014]). The conductive agent added the electronic-conduction nature between the particles is raised, which reduces the internal resistance of a cell ([0015]). A remaining portion of the coating consists of the electrolyte, which also raises the ionic conductivity of the particles ([0016]). Therefore as shown in figure 1, each particle of the active material is substantially coated.

In a preferred example of the instant application (Pg. 15, Fig. 5), the active particles are coated with a conductive particle, aluminum, which renders the active material substantially hydrophobic. As stated above, the coating material of Nagura comprises a hydrophobic polymer and a conductive agent, which can be aluminum and is considered hydrophobic material by applicant's example. Therefore the combination of the two hydrophobic materials would render the coating layer to substantially comprise hydrophobic material.

3. Claims 1-12, 18, 26 & 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP Publication 2002-37364 (Nagura) in view of US Patent 4,808,496 (Hope).

The teachings of Nagura as discussed above are incorporated herein.

Nagura does not teach coating the entire active material particle with the polymer.

Hope teaches coating the entire active material particle with a polymer having electrical and ionic conductive materials within the polymer (Abstract, 3:45-4:55). Coating the entire particle increases the surface area of the particle, which in turn increases the performance characteristics and life of the electrodes (2:1-6).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the active material partial coating of Nagura with the full particle coating of Hope to increase the surface area of the particles and increase the performance characteristics and life of the electrodes. Furthermore, by

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fully coating the particles of Nagura, the electrode gains more flexibility and reduces further the internal resistance of the battery.

4. Claims 18 & 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Publication 2002/0028380 (Tanjo).

The teachings of Tanjo as described above are incorporated herein.

Tanjo teaches a coating to particle ratio of about 33% ([0077]). The different parts of the coating produce different properties for the electrode. For instance, the polyvinylidene fluoride provides for a hydrophilic electrode but inhibits the conductivity, while the carbon provides conductivity to the electrode. It would have been obvious to one having ordinary skill at the time of the invention to vary the coating to particle weight ratio to optimize the ratio of hydrophobic and conductive properties, since it is held that discovering an optimum value of a result effective variable involves only routine skill in the art (MPEP 2144.05).

Regarding claim 18, Tanjo teaches coating the active material particles with carbon to increase the conductivity of the electrode, but fails to teach the use of aluminum. Since aluminum is used as the current collector for the electrode material, the use of the aluminum in the coating of the electrode material would provide better contact between the two substances since contact between the same materials would hinder any corrosion due to electro-potential differences. It would have been obvious to one skilled in the art to choose aluminum as an equivalent conductive material to coat

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the particles, since the selection of a material on the basis of its suitability for the intended use is a matter of design choice.

Response to Arguments

Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 8/23/06 have been fully considered but they are not persuasive. Applicant argues hindsight reasoning in the rejection of Nagura in view of Hope. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). As pointed to in the rejection above, the motivation for combining references comes from the teachings of the references and not from the applicant's disclosure.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

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In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, as discussed above, Nagura teaches coating a substantial portion of the active material with a hydrophobic material and gives an explanation for the addition of each part of the coating material. However, Nagura doesn't teach coating the entire particle. Hope teaches coating an entire active material particle to increase the surface area of the particle, increase the performance and increase the life of the electrode. Therefore it would be obvious to one skilled in the art to combine the teachings of Nagura with the entire coating process of Hope to create a better electrode.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Keith Walker whose telephone number is 571-272-3458. The examiner can normally be reached on Mon. - Fri. 8am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Trainer, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K. Walker



PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER